

## WEST Search History

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DATE: Thursday, October 20, 2005

<b>Hide?</b>	<b>Set Name</b>	<b>Query</b>	<b>Hit Count</b>
	<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI; THES=ASSIGNEE; PLUR=YES; OP=ADJ</i>		
<input type="checkbox"/>	L8	L7 and (mortierella or alpina)	36
<input type="checkbox"/>	L7	L6 and 6 adj desaturase	96
<input type="checkbox"/>	L6	L5 and (gene or dna or cdna or clon\$8)	1009
<input type="checkbox"/>	L5	L4 or l3	1139
<input type="checkbox"/>	L4	L2 and polyunsaturated fatty acids	1121
<input type="checkbox"/>	L3	L2 and poly unsaturated fatty acids	70
<input type="checkbox"/>	L2	desaturase	3515
<input type="checkbox"/>	L1	6 adj3 7 desaturase	1

END OF SEARCH HISTORY

## Hit List

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Search Results - Record(s) 1 through 1 of 1 returned.

- ☐ 1. Document ID: WO 200192489 A2, AU 200163473 A

Using default format because multiple data bases are involved.

L1: Entry 1 of 1

File: DWPI

Dec 6, 2001

DERWENT-ACC-NO: 2002-106306

DERWENT-WEEK: 200225

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TITLE: New FAT-5, FAT-6 and FAT-7 desaturase proteins from *Caenorhabditis elegans*, for producing unsaturated of fatty acids useful in infant formula, dietary supplements, and nutraceutical and pharmaceutical compositions

INVENTOR: BROWSE, J A; WATTS, J L

PRIORITY-DATA: 2000US-207699P (May 26, 2000)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
WO 200192489 A2	December 6, 2001	E	057	C12N009/00
AU 200163473 A	December 11, 2001		000	C12N009/00

INT-CL (IPC): C12 N 9/00

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Abstracts	Claims	KMDC	Draw D
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[Clear](#)[Generate Collection](#)[Print](#)[Fwd Refs](#)[Bkwd Refs](#)[Generate OACS](#)

Terms	Documents
6 adj3 7 desaturase	1

Display Format: -

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## Hit List

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Search Results - Record(s) 1 through 30 of 36 returned.

☐ 1. Document ID: US 20050220901 A1

Using default format because multiple data bases are involved.

L8: Entry 1 of 36

File: PGPB

Oct 6, 2005

PGPUB-DOCUMENT-NUMBER: 20050220901

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20050220901 A1

TITLE: Methods of pharmaceutical separation from plants

PUBLICATION-DATE: October 6, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Huttenbauer, Samuel JR.	Cincinnati	OH	US

US-CL-CURRENT: 424/725

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMHC	Draw D
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☐ 2. Document ID: US 20050214761 A1

L8: Entry 2 of 36

File: PGPB

Sep 29, 2005

PGPUB-DOCUMENT-NUMBER: 20050214761

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20050214761 A1

TITLE: Novel elongase gene and method for producing polyunsaturated fatty acids

PUBLICATION-DATE: September 29, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Lerchl, Jens	Svalov		SE
Heinz, Ernst	Hamburg		DE
Zank, Thorsten	Hamburg		DE

US-CL-CURRENT: 435/6; 435/134, 435/193, 435/252.3, 435/471, 435/69.1, 536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMHC	Draw D
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☐ 3. Document ID: US 20050166271 A1

L8: Entry 3 of 36

File: PGPB

Jul 28, 2005

PGPUB-DOCUMENT-NUMBER: 20050166271  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20050166271 A1

TITLE: Fatty acid desaturase gene obtained from pomegranate and method for the production of unsaturated fatty acids

PUBLICATION-DATE: July 28, 2005

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Feubner, Ivo	Halle		DE
Hornung, Ellen	Quedlinburg		DE
Pernstich, Christian	Halle		DE
Renz, Andreas	Limburgerhof		DE

US-CL-CURRENT: 800/8; 435/190, 435/320.1, 435/325, 435/419, 435/468, 435/6,  
435/69.1, 536/23.2, 800/281

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw D
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☐ 4. Document ID: US 20050132442 A1

L8: Entry 4 of 36

File: PGPB

Jun 16, 2005

PGPUB-DOCUMENT-NUMBER: 20050132442  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20050132442 A1

TITLE: Delta 15 desaturases suitable for altering levels of polyunsaturated fatty acids in oleaginous plants and yeast

PUBLICATION-DATE: June 16, 2005

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Yadav, Narendra S.	Chadds Ford	PA	US
Zhang, Hongxiang	Chadds Ford	PA	US

US-CL-CURRENT: 800/281; 435/134, 435/190, 435/254.2, 435/419, 435/468, 435/483,  
536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw D
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☐ 5. Document ID: US 20050132441 A1

L8: Entry 5 of 36

File: PGPB

Jun 16, 2005

PGPUB-DOCUMENT-NUMBER: 20050132441

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20050132441 A1

TITLE: Delta15 desaturases suitable for altering levels of polyunsaturated fatty acids in oilseed plants and oleaginous yeast

PUBLICATION-DATE: June 16, 2005

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Damude, Howard Glenn	Hockessin	DE	US
Yadav, Narendra S.	Chadds Ford	PA	US

US-CL-CURRENT: 800/281; 435/468, 554/8

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw D
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☐ 6. Document ID: US 20050089865 A1

L8: Entry 6 of 36

File: PGPB

Apr 28, 2005

PGPUB-DOCUMENT-NUMBER: 20050089865

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20050089865 A1

TITLE: Delta 6 desaturases from primulaceae, expressing plants and pufa-containing oils

PUBLICATION-DATE: April 28, 2005

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Napier, Johnathan A	Bristol		GB
Sayanova, Olga	Hertfordshire		GB

US-CL-CURRENT: 435/6; 435/190, 435/252.3, 435/320.1, 435/419, 435/69.1, 536/23.2, 800/281

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw D
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☐ 7. Document ID: US 20050005329 A1

L8: Entry 7 of 36

File: PGPB

Jan 6, 2005

PGPUB-DOCUMENT-NUMBER: 20050005329

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20050005329 A1

TITLE: Delta4-desaturase genes and uses thereof

PUBLICATION-DATE: January 6, 2005

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Mukerji, Pradip	Gahanna	OH	US
Thurmond, Jennifer	Columbus	OH	US
Huang, Yung-Sheng	Upper Arlington	OH	US
Das, Tapas	Worthington	OH	US
Leonard, Amanda Eun-Yeong	Gahanna	OH	US
Pereira, Suzette L.	Westerville	OH	US

US-CL-CURRENT: 800/281; 426/601, 435/320.1, 435/419, 435/468, 530/370, 530/371,  
536/23.6, 536/23.74, 800/278

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 8. Document ID: US 20050005328 A1

L8: Entry 8 of 36

File: PGPB

Jan 6, 2005

PGPUB-DOCUMENT-NUMBER: 20050005328

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20050005328 A1

TITLE: Delta4-desaturase genes and uses thereof

PUBLICATION-DATE: January 6, 2005

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Mukerji, Pradip	Gahanna	OH	US
Thurmond, Jennifer	Columbus	OH	US
Huang, Yung-Sheng	Upper Arlington	OH	US
Das, Tapas	Worthington	OH	US
Leonard, Amanda Eun-Yeong	Gahanna	OH	US
Pereira, Suzette L.	Westerville	OH	US

US-CL-CURRENT: 800/281; 435/190, 435/419, 435/468, 435/6, 435/69.1, 536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 9. Document ID: US 20050003442 A1

L8: Entry 9 of 36

File: PGPB

Jan 6, 2005

PGPUB-DOCUMENT-NUMBER: 20050003442  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20050003442 A1

TITLE: Delta4-desaturase genes and uses thereof

PUBLICATION-DATE: January 6, 2005

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Mukerji, Pradip	Gahanna	OH	US
Thurmond, Jennifer	Columbus	OH	US
Huang, Yung-Sheng	Upper Arlington	OH	US
Das, Tapas	Worthington	OH	US
Leonard, Amanda Eun-Yeong	Gahanna	OH	US
Pereira, Suzette L.	Westerville	OH	US

US-CL-CURRENT: 435/6, 435/190, 435/254.2, 435/483, 435/69.1, 514/560, 536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 10. Document ID: US 20040172682 A1

L8: Entry 10 of 36

File: PGPB

Sep 2, 2004

PGPUB-DOCUMENT-NUMBER: 20040172682  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20040172682 A1

TITLE: Production of very long chain polyunsaturated fatty acids in oilseed plants

PUBLICATION-DATE: September 2, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Kinney, Anthony J.	Wilmington	DE	US
Cahoon, Edgar Benjamin	Webster Groves	MO	US
Damude, Howard Glenn	Hockessin	DE	US
Hitz, William D.	Wilmington	DE	US
Liu, Zhan-Bin	West Chester	PA	US
Kolar, Charles W. JR.	St. Louis	DE	US

US-CL-CURRENT: 800/281

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 11. Document ID: US 20040158052 A1

L8: Entry 11 of 36

File: PGPB

Aug 12, 2004

PGPUB-DOCUMENT-NUMBER: 20040158052  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20040158052 A1

TITLE: Annexin and P34 promoters and use in expression of transgenic genes in plants

PUBLICATION-DATE: August 12, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Kinney, Anthony J.	Wilmington	DE	US
Liu, Zhan-Bin	West Chester	PA	US

US-CL-CURRENT: 536/23.6; 800/281, 800/287, 800/312

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 12. Document ID: US 20040078845 A1

L8: Entry 12 of 36

File: PGPB

Apr 22, 2004

PGPUB-DOCUMENT-NUMBER: 20040078845  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20040078845 A1

TITLE: Production of gamma linolenic acid by a delta 6-desaturase

PUBLICATION-DATE: April 22, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Thomas, Terry L.	College Station	TX	US

US-CL-CURRENT: 800/281; 435/190, 435/320.1, 435/419, 435/69.1, 536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. De
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☐ 13. Document ID: US 20030196217 A1

L8: Entry 13 of 36

File: PGPB

Oct 16, 2003

PGPUB-DOCUMENT-NUMBER: 20030196217  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20030196217 A1

TITLE: Desaturase genes, enzymes encoded thereby, and uses thereof

PUBLICATION-DATE: October 16, 2003

INVENTOR-INFORMATION:



NAME	CITY	STATE	COUNTRY
Mukerji, Pradip	Gahanna	OH	US
Pereira, Suzette L.	Westerville	OH	US
Huang, Yung-Sheng	Upper Arlington	OH	US

US-CL-CURRENT: 800/281; 435/134, 435/190, 435/320.1, 435/419, 435/69.1, 536/23.2, 554/9

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 14. Document ID: US 20030190733 A1

L8: Entry 14 of 36

File: PGPB

Oct 9, 2003

PGPUB-DOCUMENT-NUMBER: 20030190733

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030190733 A1

TITLE: Desaturase genes and uses thereof

PUBLICATION-DATE: October 9, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Mukerji, Pradip	Gahanna	OH	US
Huang, Yung-Sheng	Columbus	OH	US
Das, Tapas	Worthington	OH	US
Thurmond, Jennifer	Columbus	OH	US
Pereira, Suzette L.	Westerville	OH	US

US-CL-CURRENT: 435/190; 435/134, 435/254.2, 435/320.1, 435/69.1, 536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 15. Document ID: US 20030167525 A1

L8: Entry 15 of 36

File: PGPB

Sep 4, 2003

PGPUB-DOCUMENT-NUMBER: 20030167525

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030167525 A1

TITLE: Desaturase genes and uses thereof

PUBLICATION-DATE: September 4, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Mukerji, Pradip	Gahanna	OH	US
Huang, Yung-Sheng	Upper Arlington	OH	US

Das, Tapas	Worthington	OH	US
Thurmond, Jennifer	Columbus	OH	US
Leonard, Amanda Eun-Yeong	Columbus	OH	US
Pereira, Suzette L.	Westerville	OH	US

US-CL-CURRENT: 800/281; 435/190, 435/320.1, 435/419, 435/69.1, 536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 16. Document ID: US 20030157144 A1

L8: Entry 16 of 36

File: PGPB

Aug 21, 2003

PGPUB-DOCUMENT-NUMBER: 20030157144

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030157144 A1

TITLE: Desaturase genes and uses thereof

PUBLICATION-DATE: August 21, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Mukerji, Pradip	Gahanna	OH	US
Huang, Yung-Sheng	Columbus	OH	US
Das, Tapas	Worthington	OH	US
Thurmond, Jennifer	Columbus	OH	US
Pereira, Suzette L.	Westerville	OH	US

US-CL-CURRENT: 424/439; 435/134, 435/190, 435/320.1, 435/325, 435/419, 435/69.1, 536/23.2, 554/9, 800/17, 800/281

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 17. Document ID: US 20030134400 A1

L8: Entry 17 of 36

File: PGPB

Jul 17, 2003

PGPUB-DOCUMENT-NUMBER: 20030134400

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030134400 A1

TITLE: Delta4-desaturase genes and uses thereof

PUBLICATION-DATE: July 17, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Mukerji, Pradip	Gahanna	OH	US
Thurmond, Jennifer	Columbus	OH	US

Huang, Yung-Sheng	Upper Arlington	OH	US
Das, Tapas	Worthington	OH	US
Leonard, Amanda Eun-Yeong	Gahanna	OH	US
Pereira, Suzette L.	Westerville	OH	US

US-CL-CURRENT: [435/134](#); [435/190](#), [435/254.2](#), [435/320.1](#), [435/419](#), [435/69.1](#), [536/23.2](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Draw D
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☐ 18. Document ID: US 20030104596 A1

L8: Entry 18 of 36

File: PGPB

Jun 5, 2003

PGPUB-DOCUMENT-NUMBER: 20030104596

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030104596 A1

TITLE: human desaturase gene and uses thereof

PUBLICATION-DATE: June 5, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Mukerji, Pradip	Gahanna	OH	US
Leonard, Amanda Eun-Yeong	Gahanna	OH	US
Huang, Yung-Sheng	Columbus	OH	US
Das, Tapas	Worthington	OH	US

US-CL-CURRENT: [435/190](#); [435/134](#), [435/320.1](#), [435/325](#), [435/69.1](#), [536/23.2](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Draw D
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☐ 19. Document ID: US 20020138874 A1

L8: Entry 19 of 36

File: PGPB

Sep 26, 2002

PGPUB-DOCUMENT-NUMBER: 20020138874

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020138874 A1

TITLE: Elongase genes and uses thereof

PUBLICATION-DATE: September 26, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Mukerji, Pradip	Gahanna	OH	US
Leonard, Amanda Eun-Yeong	Gahanna	OH	US
Huang, Yung-Sheng	Upper Arlington	OH	US

Pereira, Suzette L.

Westerville

OH

US

US-CL-CURRENT: 800/281; 435/193, 435/320.1, 435/410, 435/69.1, 536/23.2

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMIC	Draw D
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☐ 20. Document ID: US 20020110582 A1

L8: Entry 20 of 36

File: PGPB

Aug 15, 2002

PGPUB-DOCUMENT-NUMBER: 20020110582

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020110582 A1

TITLE: Use of arachidonic acid for enhanced culturing of fish larvae and broodstock

PUBLICATION-DATE: August 15, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Place, Allen R.	Baltimore	MD	US
Harel, Moti	Baltimore	MD	US

US-CL-CURRENT: 424/442; 514/560

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMIC	Draw D
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☐ 21. Document ID: US 20020108147 A1

L8: Entry 21 of 36

File: PGPB

Aug 8, 2002

PGPUB-DOCUMENT-NUMBER: 20020108147

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020108147 A1

TITLE: Production of gamma linolenic acid by a delta6-desaturase

PUBLICATION-DATE: August 8, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Thomas, Terry L.	College Station	TX	US

US-CL-CURRENT: 800/281; 536/23.6, 800/278, 800/287

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMIC	Draw D
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☐ 22. Document ID: US 20020104124 A1

L8: Entry 22 of 36

File: PGPB

Aug 1, 2002

PGPUB-DOCUMENT-NUMBER: 20020104124  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20020104124 A1

TITLE: Method of modifying the content of cottonseed oil

PUBLICATION-DATE: August 1, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Green, Allan	Braddon		AU
Singh, Surinder	Downer		AU
Liu, Qing	Latham		AU

US-CL-CURRENT: 800/281; 435/190, 536/23.2, 800/314

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 23. Document ID: US 20010023259 A1

L8: Entry 23 of 36

File: PGPB

Sep 20, 2001

PGPUB-DOCUMENT-NUMBER: 20010023259  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20010023259 A1

TITLE: Conjugated fatty acids and related compounds

PUBLICATION-DATE: September 20, 2001

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Slabas, Antoni Ryszard	High Shincliff		GB
Simon, Josiah William	High Shincliff		GB
Christie, William Walker	Dundee		GB

US-CL-CURRENT: 514/560; 514/552, 554/230

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 24. Document ID: US 6858416 B2

L8: Entry 24 of 36

File: USPT

Feb 22, 2005

US-PAT-NO: 6858416  
DOCUMENT-IDENTIFIER: US 6858416 B2

TITLE: Human desaturase gene and uses thereof

DATE-ISSUED: February 22, 2005

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mukerji; Pradip	Gahanna	OH		
Leonard; Amanda Eun-Yeong	Gahanna	OH		
Huang; Yung-Sheng	Columbus	OH		
Das; Tapas	Worthington	OH		

US-CL-CURRENT: 435/189; 435/136, 435/252.3, 435/320.1, 530/350, 536/23.2

## ABSTRACT:

The subject invention relates to the identification of a gene involved in the desaturation of polyunsaturated fatty acids at carbon 5 (i.e., "human .DELTA.5-desaturase") and to uses thereof. In particular, human .DELTA.5-desaturase may be utilized, for example, in the conversion of dihomogamma-linolenic acid (DGLA) to arachidonic acid (AA) and in the conversion of 20:4n-3 to eicosapentaenoic acid (EPA). AA or polyunsaturated fatty acids produced therefrom may be added to pharmaceutical compositions, nutritional compositions, animal feeds, as well as other products such as cosmetics.

4 Claims, 43 Drawing figures  
Exemplary Claim Number: 1  
Number of Drawing Sheets: 39

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequence	Attachments	Claims	RMIC	Draw D
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☐ 25. Document ID: US 6683232 B1

L8: Entry 25 of 36

File: USPT

Jan 27, 2004

US-PAT-NO: 6683232

DOCUMENT-IDENTIFIER: US 6683232 B1

TITLE: Production of gamma-linolenic acid by a .DELTA.6-desaturase

DATE-ISSUED: January 27, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Thomas; Terry L.	College Station	TX		

US-CL-CURRENT: 800/281; 435/468, 435/471, 435/69.1, 435/71.1, 800/298

## ABSTRACT:

Linoleic acid is converted into gamma-linolenic acid by the enzyme .DELTA.6-desaturase. The present invention is directed to isolated nucleic acids comprising the .DELTA.6-desaturase gene. More particularly, the isolated nucleic acid comprises the promoter, coding region and termination regions of the .DELTA.6-desaturase gene. The present invention provides recombinant constructions

comprising the .DELTA.6-desaturase coding region in functional combination with heterologous regulatory sequences. The nucleic acids and recombinant constructions of the instant invention are useful in the production of GLA in transgenic organisms.

10 Claims, 32 Drawing figures  
Exemplary Claim Number: 1  
Number of Drawing Sheets: 27

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 26. Document ID: US 6635451 B2

L8: Entry 26 of 36

File: USPT

Oct 21, 2003

US-PAT-NO: 6635451  
DOCUMENT-IDENTIFIER: US 6635451 B2

TITLE: Desaturase genes and uses thereof

DATE-ISSUED: October 21, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mukerji; Pradip	Gahanna	OH		
Huang; Yung-Sheng	Columbus	OH		
Das; Tapas	Worthington	OH		
Thurmond; Jennifer	Columbus	OH		
Pereira; Suzette L.	Westerville	OH		

US-CL-CURRENT: 435/71.1; 424/93.21, 424/93.7, 435/189, 435/320.1, 536/23.1, 536/23.2

ABSTRACT:

The subject invention relates to the identification of genes involved in the desaturation of polyunsaturated fatty acids at carbon 5 (i.e., ".DELTA.5-desaturase") and at carbon 6 (i.e., ".DELTA.6-desaturase") and to uses thereof. In particular, .DELTA.5-desaturase may be utilized, for example, in the conversion of dihomogamma-linolenic acid (DGLA) to arachidonic acid (AA) and in the conversion of 20:4n-3 to eicosapentaenoic acid (EPA). Delta-6 desaturase may be used, for example, in the conversion of linoleic (LA) to gamma-linolenic acid (GLA). AA or polyunsaturated fatty acids produced therefrom may be added to pharmaceutical compositions, nutritional compositions, animal feeds, as well as other products such as cosmetics.

22 Claims, 7 Drawing figures  
Exemplary Claim Number: 16  
Number of Drawing Sheets: 7

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 27. Document ID: US 6432684 B1

L8: Entry 27 of 36

File: USPT

Aug 13, 2002

US-PAT-NO: 6432684

DOCUMENT-IDENTIFIER: US 6432684 B1

TITLE: Human desaturase gene and uses thereof

DATE-ISSUED: August 13, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mukerji; Pradip	Gahanna	OH		
Leonard; Amanda Eun-Yeong	Gahanna	OH		
Huang; Yung-Sheng	Columbus	OH		
Das; Tapas	Worthington	OH		

US-CL-CURRENT: 435/136; 435/189, 435/252.3, 435/320.1, 530/350, 536/23.2

## ABSTRACT:

The subject invention relates to the identification of a gene involved in the desaturation of polyunsaturated fatty acids at carbon 5 (i.e., "human .DELTA.5-desaturase") and to uses thereof. In particular, human .DELTA.5-desaturase may be utilized, for example, in the conversion of dihomo-.gamma.-linolenic acid (DGLA) to arachidonic acid (AA) and in the conversion of 20:4n-3 to eicosapentaenoic acid (EPA). AA or polyunsaturated fatty acids produced therefrom may be added to pharmaceutical compositions, nutritional compositions, animal feeds, as well as other products such as cosmetics.

17 Claims, 43 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 39

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw De
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☐ 28. Document ID: US 6428990 B1

L8: Entry 28 of 36

File: USPT

Aug 6, 2002

US-PAT-NO: 6428990

DOCUMENT-IDENTIFIER: US 6428990 B1

TITLE: Human desaturase gene and uses thereof

DATE-ISSUED: August 6, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
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Mukerji; Pradip	Gahanna	OH
Leonard; Amanda Eun-Yeong	Gahanna	OH
Huang; Yung-Sheng	Columbus	OH
Parker-Barnes; Jennifer M.	New Albany	OH

US-CL-CURRENT: 435/134; 435/135, 435/136, 435/189, 435/252.3, 435/320.1, 530/350, 536/23.2

**ABSTRACT:**

The subject invention relates to the identification of a gene involved in the desaturation of polyunsaturated fatty acids at carbon 5 (i.e., "human .DELTA.5-desaturase") and to uses thereof. In particular, human .DELTA.5-desaturase may be utilized, for example, in the conversion of dihomo-.gamma.-linolenic acid (DGLA) to arachidonic acid (AA) and in the conversion of 20:4n-3 to eicosapentaenoic acid (EPA). AA or polyunsaturated fatty acids produced therefrom may be added to pharmaceutical compositions, nutritional compositions, animal feeds, as well as other products such as cosmetics.

6 Claims, 48 Drawing figures  
Exemplary Claim Number: 1  
Number of Drawing Sheets: 48

Full	Title	Citation	Front	Review	Classification	Date	Reference	Serials	Abstracts	Claims	KWIC	Draw D
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☐ 29. Document ID: US 6410288 B1

L8: Entry 29 of 36

File: USPT

Jun 25, 2002

US-PAT-NO: 6410288

DOCUMENT-IDENTIFIER: US 6410288 B1

TITLE: Methods and compositions for synthesis of long chain poly-unsaturated fatty acids

DATE-ISSUED: June 25, 2002

**INVENTOR-INFORMATION:**

NAME	CITY	STATE	ZIP CODE	COUNTRY
Knutzon; Deborah	Granite Bay	CA		
Mukerji; Pradip	Gahanna	OH		
Huang; Yung-Sheng	Upper Arlington	OH		
Thurmond; Jennifer	Columbus	OH		
Chaudhary; Sunita	Westerville	OH		

US-CL-CURRENT: 435/189; 536/23.2

**ABSTRACT:**

The present invention relates to fatty acid desaturases able to catalyze the conversion of oleic acid to linoleic acid, linoleic acid to gamma-linolenic acid, or of alpha-linolenic acid to stearidonic acid. Nucleic acid sequences encoding

desaturases, nucleic acid sequences which hybridize thereto, DNA constructs comprising a desaturase gene, and recombinant host microorganism or animal expressing increased levels of a desaturase are described. Methods for desaturating a fatty acid and for producing a desaturated fatty acid by expressing increased levels of a desaturase are disclosed. Fatty acids, and oils containing them, which have been desaturated by a desaturase produced by recombinant host microorganisms or animals are provided. Pharmaceutical compositions, infant formulas or dietary supplements containing fatty acids which have been desaturated by a desaturase produced by a recombinant host microorganism or animal also are described.

20 Claims, 19 Drawing figures  
Exemplary Claim Number: 1  
Number of Drawing Sheets: 16

Full	Title	Citation	Front	Review	Classification	Date	Reference	Source/CBS	Attachment	Claims	KMIC	Draw De
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☐ 30. Document ID: US 6355861 B1

L8: Entry 30 of 36

File: USPT

Mar 12, 2002

US-PAT-NO: 6355861  
DOCUMENT-IDENTIFIER: US 6355861 B1

TITLE: Production of gamma linolenic acid by a .DELTA.6-desaturase

DATE-ISSUED: March 12, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Thomas; Terry L.	College Station	TX		

US-CL-CURRENT: 800/281; 435/252.3, 435/325, 435/410, 435/440, 435/468, 435/471,  
536/23.2, 800/298

ABSTRACT:

Linoleic acid is converted into .gamma.-linolenic acid by the enzyme .DELTA.6-desaturase. The present invention is directed to isolated nucleic acids comprising the .DELTA.6-desaturase gene. More particularly, the isolated nucleic acid comprises the promoter, coding region and termination regions of the .DELTA.6-desaturase gene. The present invention provides recombinant constructions comprising the .DELTA.6-desaturase coding region in functional combination with heterologous regulatory sequences. The nucleic acids and recombinant constructions of the instant invention are useful in the production of GLA in transgenic organisms.

40 Claims, 32 Drawing figures  
Exemplary Claim Number: 1  
Number of Drawing Sheets: 27

Full	Title	Citation	Front	Review	Classification	Date	Reference	Source/CBS	Attachment	Claims	KMIC	Draw De
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## Hit List

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Search Results - Record(s) 31 through 36 of 36 returned.

☐ 31. Document ID: US 6136574 A

Using default format because multiple data bases are involved.

L8: Entry 31 of 36

File: USPT

Oct 24, 2000

US-PAT-NO: 6136574

DOCUMENT-IDENTIFIER: US 6136574 A

**\*\* See image for Certificate of Correction \*\***TITLE: Methods and compositions for synthesis of long chain polyunsaturated fatty acids

DATE-ISSUED: October 24, 2000

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Knutzon; Deborah	Granite Bay	CA		
Mukerji; Pradip	Gahanna	OH		
Huang; Yung-Sheng	Upper Arlington	OH		
Thurmond; Jennifer	Columbus	OH		
Chaudhary; Sunita	Pearland	TX		

US-CL-CURRENT: 435/134; 435/136

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Draw D
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☐ 32. Document ID: US 5968809 A

L8: Entry 32 of 36

File: USPT

Oct 19, 1999

US-PAT-NO: 5968809

DOCUMENT-IDENTIFIER: US 5968809 A

**\*\* See image for Certificate of Correction \*\***TITLE: Methods and compositions for synthesis of long chain poly-unsaturated fatty acids

DATE-ISSUED: October 19, 1999

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Knutzon; Deborah	Granite Bay	CA		

Mukerji; Pradip	Gahanna	OH
Huang; Yung-Sheng	Upper Arlington	OH
Thurmond; Jennifer	Columbus	OH
Chaudhary; Sunita	Westerville	OH

US-CL-CURRENT: 435/254.2; 435/189, 435/254.21, 435/320.1, 435/325, 435/410,  
536/23.1, 536/23.2, 536/23.7, 536/23.74, 536/24.32

## ABSTRACT:

The present invention relates to fatty acid desaturases able to catalyze the conversion of oleic acid to linoleic acid, linoleic acid to gamma-linolenic acid, or of alpha-linolenic acid to stearidonic acid. Nucleic acid sequences encoding desaturases, nucleic acid sequences which hybridize thereto, DNA constructs comprising a desaturase gene, and recombinant host microorganism or animal expressing increased levels of a desaturase are described. Methods for desaturating a fatty acid and for producing a desaturated fatty acid by expressing increased levels of a desaturase are disclosed. Fatty acids, and oils containing them, which have been desaturated by a desaturase produced by recombinant host microorganisms or animals are provided. Pharmaceutical compositions, infant formulas or dietary supplements containing fatty acids which have been desaturated by a desaturase produced by a recombinant host microorganism or animal also are described.

30 Claims, 18 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 16

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 33. Document ID: US 5789220 A

L8: Entry 33 of 36

File: USPT

Aug 4, 1998

US-PAT-NO: 5789220

DOCUMENT-IDENTIFIER: US 5789220 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Production of .gamma.-linolenic acid by a .DELTA.6-desaturase

DATE-ISSUED: August 4, 1998

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Thomas; Terry L.	College Station	TX		
Reddy; Avutu S.	Bryan	TX		
Nuccio; Michael	College Station	TX		
Nunberg; Andrew N.	Bryan	TX		
Freyssinet; Georges L.	Saint Cyr au mont d'or			FR

US-CL-CURRENT: 435/189; 435/183, 435/219, 435/69.1, 530/350, 536/23.2

## ABSTRACT:

Linoleic acid is converted into .gamma.-linolenic acid by the enzyme .DELTA.6-desaturase. The present invention is directed to isolated nucleic acids comprising the .DELTA.6-desaturase gene. More particularly, the isolated nucleic acid comprises the promoter, coding region and termination regions of the .DELTA.6-desaturase gene. The present invention provides recombinant constructions comprising the .DELTA.6-desaturase coding region in functional combination with heterologous regulatory sequences. The nucleic acids and recombinant constructions of the instant invention are useful in the production of GLA in transgenic organisms.

1 Claims, 15 Drawing figures  
Exemplary Claim Number: 1  
Number of Drawing Sheets: 8

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMIC	Draw D
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☐ 34. Document ID: US 5614393 A

L8: Entry 34 of 36

File: USPT

Mar 25, 1997

US-PAT-NO: 5614393

DOCUMENT-IDENTIFIER: US 5614393 A

**\*\* See image for Certificate of Correction \*\***

TITLE: Production of .gamma.-linolenic acid by a .DELTA.6-desaturase

DATE-ISSUED: March 25, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Thomas; Terry L.	College Station	TX		
Reddy; Avutu S.	Bryan	TX		
Nuccio; Michael	College Station	TX		
Nunberg; Andrew N.	Bryan	TX		
Freyssinet; Georges L.	Saint Cyr au mont d'or			FR

US-CL-CURRENT: 435/134, 435/189, 435/243, 435/252.3, 435/254.11, 435/320.1, 435/325, 435/411, 435/412, 435/414, 435/415, 435/416, 435/419, 435/69.1, 435/70.1, 435/71.1, 536/23.2, 536/23.6, 536/24.1, 800/281, 800/298, 800/306, 800/312, 800/317.3, 800/320.1, 800/322

ABSTRACT:

Linoleic acid is converted into .gamma.-linolenic acid by the enzyme .DELTA.6-desaturase. The present invention is directed to isolated nucleic acids comprising the .DELTA.6-desaturase gene. More particularly, the isolated nucleic acid comprises the promoter, coding region and termination regions of the .DELTA.6-desaturase gene. The present invention provides recombinant constructions comprising the .DELTA.6-desaturase coding region in functional combination with heterologous regulatory sequences. The nucleic acids and recombinant constructions of the instant invention are useful in the production of GLA in transgenic organisms.

44 Claims, 15 Drawing figures  
 Exemplary Claim Number: 1  
 Number of Drawing Sheets: 8

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Draw D
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☐ 35. Document ID: WO 2004101753 A2, US 20040253621 A1

L8: Entry 35 of 36

File: DWPI

Nov 25, 2004

DERWENT-ACC-NO: 2005-021124

DERWENT-WEEK: 200504

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TITLE: New nucleic acid molecules encoding fatty acid desaturases and elongases, useful for producing polyunsaturated fatty acids

INVENTOR: PICATAGGIO, S K; ZHU, Q Q

PRIORITY-DATA: 2003US-468718P (May 7, 2003), 2003US-468677P (May 7, 2003), 2004US-0840478 (May 6, 2004)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
WO 2004101753 A2	November 25, 2004	E	107	C12N000/00
US 20040253621 A1	December 16, 2004		000	C12Q001/68

INT-CL (IPC): C07 H 21/04; C12 N 0/00; C12 N 1/18; C12 N 9/10; C12 N 15/74; C12 P 7/64; C12 Q 1/68

ABSTRACTED-PUB-NO: WO2004101753A

BASIC-ABSTRACT:

NOVELTY - A nucleic acid molecules encoding fatty acid Delta 6 and Delta 17 desaturases and elongases that are codon-optimized for expression in Yarrowia, is new.

DETAILED DESCRIPTION - An isolated nucleic acid molecule (I) chosen from an isolated nucleic acid molecule (N1) having a fully defined Mortierella alpina derived sequence (S1) of 1374 base pairs as given in the specification which encodes a Delta 6 desaturase enzyme having a fully defined M. alpina AF465281 derived sequence (S2) of 457 amino acids as given in the specification, where at least 144 codons are codon-optimized for expression in Yarrowia, or an isolated nucleic acid molecule that is completely complementary to (N1); an isolated nucleic acid molecule (II) chosen from an isolated nucleic acid molecule (N2) having a fully defined Saprolegnia diclina derived sequence (S3) of 1077 base pairs as given in the specification which encodes a Delta 17 desaturase enzyme having a fully defined S. diclina ATCC 56851 derived sequence (S4) of 358 amino acids as given in the specification, where at least 117 codons are codon-optimized for expression in Yarrowia or an isolated nucleic acid molecule that is completely complementary to (N1); or an isolated nucleic acid molecule (III) chosen from an isolated nucleic acid molecule (N3) having a fully defined M. alpina derived sequence (S5) of 957 base pairs as given in the specification which encodes an elongase enzyme having a fully defined M. alpina AX464731 derived sequence (S6) of 318 amino acids as given

in the specification, where at least 85 codons are codon-optimized for expression in *Yarrowia* or an isolated nucleic acid molecule that is completely complementary to (N3).

INDEPENDENT CLAIMS are also included for the following:

- (1) a chimeric gene (IV) comprising (I), (II) or (III) operably linked to suitable regulator sequences;
- (2) a transformed *Yarrowia* sp. (V) comprising (IV);
- (3) optimizing (M1) a gene for expression in an oleaginous yeast involves obtaining the sequences of nucleotide coding regions and corresponding polypeptides for the oleaginous yeast species to form a database of codons, analyzing the database of codons to determine which codons preferentially encode each amino acid, obtaining the sequence of a gene to be expressed in an oleaginous yeast species, replacing non-preferred codons in the sequence with those preferred codons of where the gene is codon-optimized for expression in an oleaginous yeast species;
- (4) an isolated nucleic acid molecule (VI) comprising a *Yarrowia* sp. translation initiation site of Met-Ala-Met-Met-Ala-Thr-Gly-Asn-His-Ser; and
- (5) a microbial oil produced using (I)-(III).

USE - (I) is useful for producing gamma -linolenic acid, which involves providing (V) comprising (I) encoding a Delta 6 desaturase polypeptide under the control of suitable regulatory sequences, and a source of desaturase substrate consisting of linoleic acid, growing (V) in the presence of a suitable fermentable carbon source, where (I) is expressed and the linoleic acid is converted to gamma -linolenic acid, and optionally recovering the produced gamma -linolenic acid.

(I) is useful for producing stearidonic acid, which involves providing (V) comprising (I) and a source of desaturase substrate consisting of alpha -linoleic acid, growing (V) in the presence of a suitable fermentable carbon source, where (I) is expressed and the alpha -linoleic acid is converted to stearidonic acid, and optionally recovering the produced stearidonic acid.

(II) is useful for producing eicosatetraenoic acid, which involves providing (V) comprising (II) and a source of desaturase substrate consisting of dihomo- gamma -linoleic acid, growing (V) in the presence of a suitable fermentable carbon source, where (II) is expressed and the dihomo- gamma -linoleic acid is converted to eicosatetraenoic acid, and optionally recovering the eicosatetraenoic acid.

(II) is useful for producing eicosapentaenoic acid, which involves providing (V) comprising (II) and a source of desaturase substrate consisting of arachidonic acid, growing (V) in the presence of a suitable fermentable carbon source, where (II) is expressed and the arachidonic acid is converted to eicosapentaenoic acid, and optionally recovering the eicosapentaenoic acid. (III) is useful for producing dihomo- gamma -linoleic acid, which involves providing (V) comprising (III) and a source of desaturase substrate consisting of dihomo- gamma -linoleic acid, growing (V) in the presence of a suitable fermentable carbon source, where (III) is expressed and the gamma -linoleic acid is converted to dihomo- gamma -linoleic acid, and optionally recovering the dihomo- gamma -linoleic acid.

(III) is useful for producing eicosatetraenoic acid, which involves providing (V) comprising (III) and a source of desaturase substrate consisting of stearidonic acid, growing (V) in the presence of a suitable fermentable carbon source, where (III) is expressed and the stearidonic acid is converted to eicosatetraenoic acid, and optionally recovering the eicosatetraenoic acid.

(III) is useful for producing docosapentaenoic acid, which involves providing (V) comprising (III) and a source of desaturase substrate consisting of docosapentaenoic acid, growing (V) in the presence of a suitable fermentable carbon source, where (III) is expressed and the eicosapentaenoic acid is converted to docosapentaenoic acid, and optionally recovering the docosapentaenoic acid.

In the above methods, the source of elongase substrate is endogenous to the *Yarrowia* sp.. (VII) is useful for optimizing the expression of a gene in a *Yarrowia* host, which involves providing a foreign gene to be expressed in *Yarrowia*, operably linking the gene with (VII), where the foreign gene is optimized for expression in *Yarrowia*. The foreign gene encodes an enzyme chosen from (E1) (all claimed).

DESCRIPTION OF DRAWING(S) - The figure shows the omega -3 and omega -6 fatty acid biosynthetic pathways.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Abstracts	Abstracts	Claims	KMC	Drawings
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□ 36. Document ID: MX 212281 B, WO 9846763 A1, AU 9869616 A, US 5968809 A, NO 9904925 A, EP 975766 A1, EP 996732 A1, CZ 9903583 A3, BR 9808507 A, CN 1252099 A, SK 9901398 A3, CN 1253588 A, NZ 337457 A, NZ 337459 A, HU 200001236 A2, US 6136574 A, AU 726807 B, MX 9909328 A1, MX 9909329 A1, KR 2001006257 A, KR 2001006258 A, JP 2001523091 W, US 6410288 B1

L8: Entry 36 of 36

File: DWPI

Dec 18, 2002

DERWENT-ACC-NO: 1998-594582

DERWENT-WEEK: 200413

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TITLE: New isolated fatty acid desaturase enzymes - used for the production of polyunsaturated fatty acids for use in, e.g. pharmaceutical compositions, nutritional compositions, cosmetics or animal feed

INVENTOR: CHAUDHARY, S; HUANG, Y ; KNUTZON, D ; LEONARD, A E ; MUKERJI, P ; THURMOND, J

PRIORITY-DATA: 1997US-0834655 (April 11, 1997), 1997US-0833610 (April 11, 1997), 1997US-0834033 (April 11, 1997), 1997US-0956985 (October 24, 1997), 1999US-0363574 (July 29, 1999), 1998WO-US07421 (April 10, 1998), 1999US-0363526 (July 29, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<u>MX 212281 B</u>	December 18, 2002		000	A23L001/30
<u>WO 9846763 A1</u>	October 22, 1998	E	165	C12N015/53
<u>AU 9869616 A</u>	November 11, 1998		000	
<u>US 5968809 A</u>	October 19, 1999		000	C12N001/16
<u>NO 9904925 A</u>	November 30, 1999		000	C12N000/00
<u>EP 975766 A1</u>	February 2, 2000	E	000	
<u>EP 996732 A1</u>	May 3, 2000	E	000	
<u>CZ 9903583 A3</u>	May 17, 2000		000	
<u>BR 9808507 A</u>	May 23, 2000		000	C12N015/53
<u>CN 1252099 A</u>	May 3, 2000		000	
<u>SK 9901398 A3</u>	May 16, 2000		000	



<u>CN 1253588 A</u>	May 17, 2000	000	
<u>NZ 337457 A</u>	July 28, 2000	000	A61K031/20
<u>NZ 337459 A</u>	July 28, 2000	000	A61K031/20
<u>HU 200001236 A2</u>	July 28, 2000	000	
<u>US 6136574 A</u>	October 24, 2000	000	C12P007/64
<u>AU 726807 B</u>	November 23, 2000	000	
<u>MX 9909328 A1</u>	September 1, 2000	000	C12N015/53
<u>MX 9909329 A1</u>	September 1, 2000	000	C12N015/53
<u>KR 2001006257 A</u>	January 26, 2001	000	C12N015/53
<u>KR 2001006258 A</u>	January 26, 2001	000	C12N015/82
<u>JP 2001523091 W</u>	November 20, 2001	174	C12N015/09
<u>US 6410288 B1</u>	June 25, 2002	000	C12N009/02

726807 B INT-CL (IPC): A23 K 1/00; A23 K 1/16; A23 L 1/28; A23 L 1/30; A61 K 7/00; A61 K 31/20; A61 K 31/202; A61 K 31/232; A61 K 38/00; A61 P 17/00; C07 H 21/04; C11 B 1/00; C12 N 0/00; C12 N 1/16; C12 N 1/19; C12 N 5/10; C12 N 9/02; C12 N 15/09; C12 N 15/53; C12 N 15/81; C12 N 15/82; C12 P 7/64

ABSTRACTED-PUB-NO: US 5968809A

BASIC-ABSTRACT:

An isolated nucleic acid having a 1617 or 1488 base pair sequence ((S1) and (S2) encoding a polypeptide of 457 or 399 amino acids ((S3) and (S4)) respectively, is new. Also claimed: (1) an isolated nucleic acid comprising a nucleotide sequence (NS) which encodes a polypeptide which desaturates a fatty acid molecule at carbon 6 or 12 from the carboxyl end of the polypeptide, where the NS has an average A/T content of < 60%; (2) a nucleic acid comprising a fungal NS which is identical to a sequence of at least 50 nucleotides in (S1) or (S2) or is complementary to this sequence; (3) an isolated nucleic acid having a NS with at least 50% homology to (S1) or (S2); (4) a nucleic acid construct comprising a NS having (S1) or (S2) operably associated with an expression control sequence functional in a microbial cell; (5) a nucleic acid construct comprising a NS having an A/T content of < 60% encoding a functionally active Delta 6-desaturase having an amino acid sequence which corresponds to or is complementary to all of or a portion of an amino acid sequence (S2), or (S4) where the NS is operably associated with a transcription control sequence functional in a yeast cell; (6) a recombinant yeast cell comprising a nucleic acid construct as in (5); (7) a recombinant yeast cell comprising at least 1 copy of a vector comprising a fungal NS which encodes a polypeptide which converts 18:2 fatty acids to 18:3 fatty acids or 18:3 fatty acids to 18:4 fatty acids, where the yeast cell or an ancestor of the yeast cell was transformed with the vector to produce the recombinant yeast cell, and where the NS is operably associated with an expression control sequence functional in the recombinant yeast cell; (8) an isolated or purified polypeptide which desaturates a fatty acid molecule at carbon 12 or carbon 6 or from the carboxyl end of the polypeptide, where the polypeptide is a fungal polypeptide or is derived from a fungal polypeptide; (9) an isolated nucleic acid encoding a polypeptide as in (8); (10) a host cell comprising a vector which includes a nucleic acid which encodes a fatty acid desaturase derived from Mortierella alpina, where the desaturase has an amino acid sequence (S3); and where the NS is operably linked to a promoter; (11) a recombinant yeast cell comprising at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 6 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S3), and at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 12 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S4), where the nucleic acid constructs are operably associated with

transcription control sequences functional in a yeast cell, and (12) a method for obtaining altered long chain polyunsaturated fatty acid (PUFA) biosynthesis comprising growing a plant having cells which contain at least 1 transgene, derived from a fungus or algae, which encode a transgene expression product which desaturates a fatty acid molecule at a carbon selected from carbon 6 and carbon 12 from the carboxyl end of the fatty acid molecule, where the at least 1 transgene is operably associated with an expression control sequence, where the at least 1 transgene is pressed, and long chain PUFA biosynthesis in the cells is altered; (13) an isolated peptide sequence selected from 11 amino acid sequences (all sequences are given in the specification)..

USE - The products and methods can be used for desaturating fatty acids. The PUFA biosynthesis method can be used for obtaining microbial oils which can be used for treating or preventing malnutrition, in pharmaceutical compositions, in a nutritional formula, as a dietary supplement, in cosmetics or in animal feed (claimed). In particular, PUFAs can be used for treating e.g. restenosis after angioplasty, inflammation, rheumatoid arthritis, asthma, psoriasis, cancer, diabetes or eczema or reduce blood pressure. They can also be used to inhibit platelet aggregation, cause vasodilation, lower cholesterol levels, inhibit proliferation of vessel wall smooth muscle and fibrous tissue, reduce or prevent gastro-intestinal bleeding and other side effects caused by non-steroidal anti-inflammatory drugs, prevent or treat endometriosis and premenstrual syndrome, treat myalgic encephalomyelitis and chronic fatigue after viral infections, treat AIDS, multiple sclerosis, acute respiratory syndrome, hypertension and inflammatory skin disorders. The recombinant eukaryotic cells, e.g. yeast cells or their ancestors transformed with a vector comprising fungal DNA encoding a polypeptide which converts ALA to stearidonic acid (SA) or oleic acid to linoleic acid (LA), or LA to gamma -linolenic acid (GLA), may be used for production of SA, LA, or GLA in a eukaryotic cell culture (claimed).

ABSTRACTED-PUB-NO:

US 6136574A EQUIVALENT-ABSTRACTS:

An isolated nucleic acid having a 1617 or 1488 base pair sequence ((S1) and (S2) encoding a polypeptide of 457 or 399 amino acids ((S3) and (S4)) respectively, is new. Also claimed: (1) an isolated nucleic acid comprising a nucleotide sequence (NS) which encodes a polypeptide which desaturates a fatty acid molecule at carbon 6 or 12 from the carboxyl end of the polypeptide, where the NS has an average A/T content of < 60%; (2) a nucleic acid comprising a fungal NS which is identical to a sequence of at least 50 nucleotides in (S1) or (S2) or is complementary to this sequence; (3) an isolated nucleic acid having a NS with at least 50% homology to (S1) or (S2); (4) a nucleic acid construct comprising a NS having (S1) or (S2) operably associated with an expression control sequence functional in a microbial cell; (5) a nucleic acid construct comprising a NS having an A/T content of < 60% encoding a functionally active Delta 6-desaturase having an amino acid sequence which corresponds to or is complementary to all of or a portion of an amino acid sequence (S2), or (S4) where the NS is operably associated with a transcription control sequence functional in a yeast cell; (6) a recombinant yeast cell comprising a nucleic acid construct as in (5); (7) a recombinant yeast cell comprising at least 1 copy of a vector comprising a fungal NS which encodes a polypeptide which converts 18:2 fatty acids to 18:3 fatty acids or 18:3 fatty acids to 18:4 fatty acids, where the yeast cell or an ancestor of the yeast cell was transformed with the vector to produce the recombinant yeast cell, and where the NS is operably associated with an expression control sequence functional in the recombinant yeast cell; (8) an isolated or purified polypeptide which desaturates a fatty acid molecule at carbon 12 or carbon 6 or from the carboxyl end of the polypeptide, where the polypeptide is a fungal polypeptide or is derived from a fungal polypeptide; (9) an isolated nucleic acid encoding a polypeptide as in (8); (10) a host cell comprising a vector which includes a nucleic acid which encodes a fatty acid desaturase derived from Mortierella alpina, where the desaturase has an

amino acid sequence (S3), and where the NS is operably linked to a promoter; (11) a recombinant yeast cell comprising at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 6 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S3), and at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 12 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S4), where the nucleic acid constructs are operably associated with transcription control sequences functional in a yeast cell, and (12) a method for obtaining altered long chain polyunsaturated fatty acid (PUFA) biosynthesis comprising growing a plant having cells which contain at least 1 transgene, derived from a fungus or algae, which encode a transgene expression product which desaturates a fatty acid molecule at a carbon selected from carbon 6 and carbon 12 from the carboxyl end of the fatty acid molecule, where the at least 1 transgene is operably associated with an expression control sequence, where the at least 1 transgene is pressed, and long chain PUFA biosynthesis in the cells is altered; (13) an isolated peptide sequence selected from 11 amino acid sequences (all sequences are given in the specification).

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fatty acid molecule at carbon 12 or carbon 6 or from the carboxyl end of the polypeptide, where the polypeptide is a fungal polypeptide or is derived from a fungal polypeptide; (9) an isolated nucleic acid encoding a polypeptide as in (8); (10) a host cell comprising a vector which includes a nucleic acid which encodes a fatty acid desaturase derived from Mortierella alpina, where the desaturase has an amino acid sequence (S3), and where the NS is operably linked to a promoter; (11) a recombinant yeast cell comprising at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 6 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S3), and at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 12 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S4), where the nucleic acid constructs are operably associated with transcription control sequences functional in a yeast cell, and (12) a method for obtaining altered long chain polyunsaturated fatty acid (PUFA) biosynthesis comprising growing a plant having cells which contain at least 1 transgene, derived from a fungus or algae, which encode a transgene expression product which desaturates a fatty acid molecule at a carbon selected from carbon 6 and carbon 12 from the carboxyl end of the fatty acid molecule, where the at least 1 transgene is operably associated with an expression control sequence, where the at least 1 transgene is pressed, and long chain PUFA biosynthesis in the cells is altered; (13) an isolated peptide sequence selected from 11 amino acid sequences (all sequences are given in the specification).

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comprising a nucleic acid construct as in (5); (7) a recombinant yeast cell comprising at least 1 copy of a vector comprising a fungal NS which encodes a polypeptide which converts 18:2 fatty acids to 18:3 fatty acids or 18:3 fatty acids to 18:4 fatty acids, where the yeast cell or an ancestor of the yeast cell was transformed with the vector to produce the recombinant yeast cell; and where the NS is operably associated with an expression control sequence functional in the recombinant yeast cell; (8) an isolated or purified polypeptide which desaturates a fatty acid molecule at carbon 12 or carbon 6 or from the carboxyl end of the polypeptide, where the polypeptide is a fungal polypeptide or is derived from a fungal polypeptide; (9) an isolated nucleic acid encoding a polypeptide as in (8); (10) a host cell comprising a vector which includes a nucleic acid which encodes a fatty acid desaturase derived from Mortierella alpina, where the desaturase has an amino acid sequence (S3), and where the NS is operably linked to a promoter; (11) a recombinant yeast cell comprising at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 6 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S3), and at least 1 nucleic acid construct comprising a NS which encodes a functionally active Delta 12 desaturase having an amino acid sequence which corresponds to or is complementary to all or a portion of an amino acid sequence (S4), where the nucleic acid constructs are operably associated with transcription control sequences functional in a yeast cell, and (12) a method for obtaining altered long chain polyunsaturated fatty acid (PUFA) biosynthesis comprising growing a plant having cells which contain at least 1 transgene, derived from a fungus or algae, which encode a transgene expression product which desaturates a fatty acid molecule at a carbon selected from carbon 6 and carbon 12 from the carboxyl end of the fatty acid molecule, where the at least 1 transgene is operably associated with an expression control sequence, where the at least 1 transgene is pressed, and long chain PUFA biosynthesis in the cells is altered; (13) an isolated peptide sequence selected from 11 amino acid sequences (all sequences are given in the specification).

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